

## Drought Monitoring and Response in Hawaii Kauai - October 3, 2022

Representatives from the National Drought Mitigation Center (NDMC), the USDA Southwest Climate Hub, East-West Center, Clark University and the Institute of Pacific Islands Forestry hosted a series of drought workshops in October 2022 on four Hawaiian Islands. The first one-day meeting was held at the Kauai Community College. Participants represented a variety of agricultural and natural resource management agencies including Kauai Emergency Management, USDA Farm Service Agency, Hawaii Department of Forestry, Hawaii Department of Water and private farms. Prior to the meeting participants noted what they hoped to gain during the meeting:

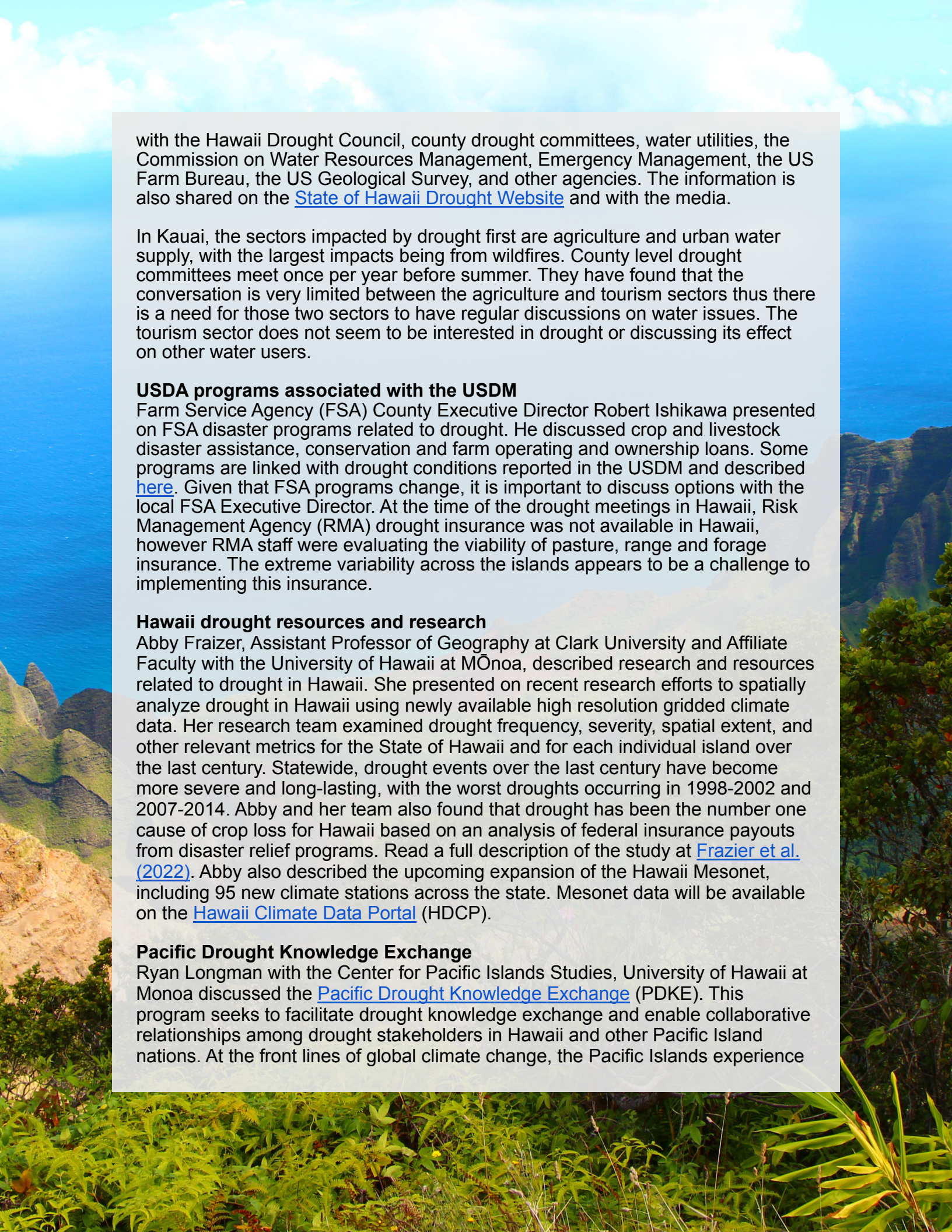
- Better understanding of near- and long-term drought and climate conditions
- Drought knowledge to apply to their program and share with their team
- Better understanding of actions that can be taken
- Stronger working relationships and new collaborations
- Better understanding of the United States Drought Monitor (USDM) and other drought tools and information for Hawaii

### **United States Drought Monitor production and process**

Brian Fuchs, climatologist and USDM author, with the National Drought Mitigation Center (NDMC) discussed how the USDM describes drought conditions by historical percentiles that are expressed in a map with different severity categories. The USDM map shows how severely dry different areas are, compared to normals for the location and time of year. The map expresses drought in four categories, each with increasing severity: moderate, severe, extreme, and exceptional drought, as well as abnormal dryness, which is used to depict areas going into or coming out of drought. The more severe drought categories indicate more unusually dry conditions and lower historical percentiles for the data being analyzed. Each week a single author analyzes physical data, such as precipitation statistics, streamflow, soil moisture, vegetation health, groundwater, and other variables. The author also considers local expert input and impact information when analyzing the physical data. Each Thursday morning the most recent map is released on the USDM website. For more information, please visit the [USDM website](#) or the NDMC's [tutorial](#) on the USDM.

### **How drought monitoring works in Hawaii**

Kauai's water supply is served mostly by groundwater so they view it as relatively resilient. However, drought is a normal part of climate and can occur anywhere. In Hawaii, USDA staff report drought conditions (precipitation, range conditions, etc.) to the Honolulu Weather Forecast Office and Hawaii Department of Land and Natural Resources. Staff review other relevant sources of information and then exchange information with both the USDM (national) author and the Hawaii state drought coordinator. The state drought coordinator shares drought information



with the Hawaii Drought Council, county drought committees, water utilities, the Commission on Water Resources Management, Emergency Management, the US Farm Bureau, the US Geological Survey, and other agencies. The information is also shared on the [State of Hawaii Drought Website](#) and with the media.

In Kauai, the sectors impacted by drought first are agriculture and urban water supply, with the largest impacts being from wildfires. County level drought committees meet once per year before summer. They have found that the conversation is very limited between the agriculture and tourism sectors thus there is a need for those two sectors to have regular discussions on water issues. The tourism sector does not seem to be interested in drought or discussing its effect on other water users.

### **USDA programs associated with the USDM**

Farm Service Agency (FSA) County Executive Director Robert Ishikawa presented on FSA disaster programs related to drought. He discussed crop and livestock disaster assistance, conservation and farm operating and ownership loans. Some programs are linked with drought conditions reported in the USDM and described [here](#). Given that FSA programs change, it is important to discuss options with the local FSA Executive Director. At the time of the drought meetings in Hawaii, Risk Management Agency (RMA) drought insurance was not available in Hawaii, however RMA staff were evaluating the viability of pasture, range and forage insurance. The extreme variability across the islands appears to be a challenge to implementing this insurance.

### **Hawaii drought resources and research**

Abby Fraizer, Assistant Professor of Geography at Clark University and Affiliate Faculty with the University of Hawaii at Mōnoa, described research and resources related to drought in Hawaii. She presented on recent research efforts to spatially analyze drought in Hawaii using newly available high resolution gridded climate data. Her research team examined drought frequency, severity, spatial extent, and other relevant metrics for the State of Hawaii and for each individual island over the last century. Statewide, drought events over the last century have become more severe and long-lasting, with the worst droughts occurring in 1998-2002 and 2007-2014. Abby and her team also found that drought has been the number one cause of crop loss for Hawaii based on an analysis of federal insurance payouts from disaster relief programs. Read a full description of the study at [Frazier et al. \(2022\)](#). Abby also described the upcoming expansion of the Hawaii Mesonet, including 95 new climate stations across the state. Mesonet data will be available on the [Hawaii Climate Data Portal](#) (HDCCP).

### **Pacific Drought Knowledge Exchange**

Ryan Longman with the Center for Pacific Islands Studies, University of Hawaii at Mōnoa discussed the [Pacific Drought Knowledge Exchange](#) (PDKE). This program seeks to facilitate drought knowledge exchange and enable collaborative relationships among drought stakeholders in Hawaii and other Pacific Island nations. At the front lines of global climate change, the Pacific Islands experience

a range of impacts, including not only drought, but sea level rise, flooding, climate-induced migration, and wildfire. PDKE was created in an effort to help the region combat these impacts. The four key aspects of a knowledge exchange include 1) sector- and geography- specific climate information, 2) better and more comprehensive information, 3) improved technical assistance, and 4) a more collaborative information-transfer environment through participation in knowledge co-production. The PDKE engages with regional stakeholders (e.g. watershed partnerships, forest reserves, national parks) to document drought stories, lessons learned, and relevant research; and to produce site-specific Climate Change, Climate Variability, and Drought (CCVD) portfolios in order to co-develop usable tools and educational items.

### Summary and next steps

Main themes that emerged during the Kauai meeting include the following:

- The participants that attended expressed the importance of having broader participation. The information from the workshop would be helpful to many on Kauai.
- Most of the work to create the drought monitor is synthesized by one person in Hawaii and the USDM authors.
- Knowing about disaster programs was helpful to the audience.
- Participants were pleased to hear that 95 new weather stations will be installed in Hawaii.
- The participants appreciated the opportunity to learn more about recent drought analysis and drought tools.

The group discussed next steps and decided that a reasonable and useful next step would be to host a virtual webinar highlighting the drought analysis, drought tools and other relevant information for those on Kauai who missed the meeting.

*Frazier, A. G., Giardina, C. P., Giambelluca, T. W., Brewington, L., Chen, Y.-L., Chu, P.-S., Berio Fortini, L., et al. (2022). A Century of Drought in Hawai'i: Geospatial Analysis and Synthesis across Hydrological, Ecological, and Socioeconomic Scales. Sustainability, 14(19), 12023. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su141912023>*

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